4th Biannual Western Modeling Workshop

September 6-8, 2017
NCAR Center Green Conference Center, Boulder, CO

Advance in-person and remote access registration required, hotel and logistics information here:
(https://westar.ticketleap.com/2017-western-modeling-workshop/)

Remote access to be added
Adobe Connect link and Conference Call line

Workshop Goals:

- Identify data gaps and application/research needs to address unique air quality management issues in the western U.S.;
- Increase collaboration between Local, Tribal and State Air Agencies, EPA, and other Federal Agencies in developing improved data sets and modeling tools to address these needs;
- Discuss and assess the data and modeling needs for the current portfolio of western U.S. programmatic analyses under the Clean Air Act; and
- Identify opportunities within the US EPA ORD/ACE (Air Climate and Energy Program) research portfolio to enhance research that addresses the western air quality management priority needs; identify research that is currently not covered by US EPA ORD or other organizations and look for additional opportunities to meet those needs.

Day One Wednesday, September 6, 2017	
Time (MDT)	**Sessions**
8:00 am	**Registration & Breakfast (on your own)**
9:00	**Welcome and Introductory Remarks** • WESTAR and WRAP • EPA Region 8 / ORD ACE / OAQPS • NCAR
9:30	**Plenary Session I: Global Model Evaluation, Development and New Source Attribution Tools** • Need for well evaluated BC data from global models for regional/urban scale air quality planning • Current state of the art for global scale models • EPA Hemispheric CMAQ model Session Leader: Gail Tonnesen, EPA Region 8 Discussion Topics/Session Outcomes: • Need for additional extensive evaluation to assess global models' ability to accurately represent episode-specific transport contributions to Ozone and $PM_{2.5}$ for NAAQS and Regional Haze planning. • Continued development of tools that translate global model output to regional model initial/boundary inputs; • Need additional source attribution tools or model sensitivity simulations to identify source contributions to international transport and;

	• Develop a plan to identify resources and collaborations to fill these needs.
11:45 am	**Lunch (on your own)**
1:00 pm	**Plenary Session II: Modeling Studies to Evaluate Regional Haze for 2028 Milestone Planning** • Overview of Western Regional Haze planning needs and emission inventories • IMPROVE data for model evaluation and Regional Haze planning • EPA First Look 2028 Regional Haze Modeling • CAMx visibility modeling performance and source apportionment estimates of natural, international and anthropogenic haze • New metric and natural conditions • States' concerns and needs for modeling haze for planning Session Lead: Tom Moore, WESTAR and WRAP Session outcomes: • Better understand relative domestic/international and natural/anthropogenic source contributions to haze to assist with future State regulatory actions • Better understanding of uncertainty in model estimates and poor model performance for regional haze evaluation and planning • Better understanding of uncertainty and model skill for natural & anthropogenic haze estimates • Improved emissions estimates for northern hemisphere anthropogenic emissions, fires, ammonia, and biogenic and geogenic sources • Better understanding of ORD modeling & monitoring for regional haze
3:00	**Break**
3:15	**Plenary Session III: Modeling Studies to Evaluate Ozone Source Contributions for SIPs** • Evaluating WRF Performance in Complex Terrain • Planning requirements and modeling for NAAQS transport SIPs • Model evaluation for Ozone in the intermountain West during FRAPPE 2014 • Source apportionment studies for Ozone SIPs • WESTAR-WRAP-API Background Ozone Scientific Assessment • Southern New Mexico Ozone Modeling Study and the §179B SIP option • Zero Out Global Model Run of Anthropogenic Global, Mexico, and Canadian Emissions Session Lead: Kevin Briggs, Colorado APCD Discussion/Session outcomes: • Better understanding of uncertainty in model estimates and poor model performance for evaluation and planning related to background / other source contributions to modeled Ozone • Better understanding by EPA OAQPS and ORD of limitations to national approach
5:00	**WRAP-up and adjourn for the day**
6:30	**No-host dinner**

<table>
<tr><th colspan="3">Day Two
Thursday, September 7, 2017</th></tr>
<tr><th>Time (MDT)</th><th colspan="2">Sessions</th></tr>
<tr><td>8:00 am</td><td colspan="2">Welcome and Agenda Review</td></tr>
<tr><td>8:15</td><td colspan="2">Plenary Session IV: Using monitor data to evaluate and develop improved emissions for wintertime air quality modeling systems
• Model performance for VOC and Ozone in winter Ozone areas
• Understanding emissions, chemical, meteorological, and terrain contribution to winter time elevated $PM_{2.5}$ in Salt Lake City
• Model performance for winter $PM_{2.5}$ in CA and UT
• Uncertainty in wood heating emissions
• Overview of the NEI2014
• Weight of Evidence Analyses to exclude poor-performing modeling days / exceptional events
<u>Session Lead:</u> Chris Pennell, UT DAQ
<u>Session outcomes</u>:
• Identify needs for future ambient monitoring for Ozone, Regional Haze, other indicators
• Assess benefits and priorities for additional inventory improvements through field studies and expanded routine monitoring;
• Discuss improved meteorological model performance for winter cold air pool modeling;
• Agree upon next steps for improving emissions inventories for residential wood combustion;
• Address uncertainty in oil and gas VOC and NOx emissions and reconciliation of top-down vs. bottom-up emissions estimates; and
• Improve model performance for winter oxidants, nitric acid and ammonium nitrate formation, including nighttime and heterogeneous pathways.</td></tr>
<tr><td>10:15</td><td colspan="2">Break</td></tr>
<tr><td>10:30</td><td>Fire Research and Air Management Needs
• WRAP Fire & Smoke Work Group priorities
• EPA's recent and planned projects related to wildland fire
• Recent NOAA Fire research highlights from and plans for the next phase of FIREX
• Other topics
<u>Session Lead</u>: Kirk Baker, EPA OAQPS
<u>Discussion/Session outcomes</u>:
• Exchange of information and improved understanding of national initiatives;
• Discussions of applied uncertainties in emissions and model estimates and poor model performance for evaluation and planning related to background O_3, Exceptional Events, and Regional Haze planning; and
• Assemble volunteer team to draft research plan to develop more reliable estimates of fire contributions to Ozone / Regional Haze.</td><td>Improved Estimates of Ammonia Emissions and Deposition
• Currently data / future research plans
• Modeled N deposition in the western U.S.
• NPS studies
• Diurnal measurements
• Ammonia Emissions Inventories
• Ammonia Bi-Directional Flux
<u>Session Lead</u>: Mike Barna, NPS ARD
<u>Discussion/Session outcomes:</u>
• Need for measurements and modeling of NH_3 and NH_4 in high population areas and in remote areas;
• NPS/CSU monitoring studies that highlighting challenges in interpreting ambient NH_3 measurements in remote areas;
• Continuous measurements of NH_3 and NH_4 to evaluate models and for comparison to long term average passive samplers.</td></tr>
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12:30 pm	**Lunch (on your own)**	
1:30 to 5:00	**Field trips departing from / returning to NCAR Center Green** *(proposed, details in development – a small fee may be required to cover transportation)* • *INSTAAR on Niwot Ridge* • *Oil & Gas Production northeast of Denver*	
Dinner and evening activities on your own		
Day Three Friday, September 8, 2017		
Time (MDT)	**Sessions**	
8:00 am	**Welcome and Agenda Review**	
8:15	**Plenary Session V: Characterizing Exceptional Events, Long Range Transport, and Infrequent Episodes** • Stratospheric Intrusion • International Transport of Ozone • Fugitive Dust • CABOTS field study in CA • FAST-LVOS study in Las Vegas Session Leads: Gail Tonnesen and Chris Pennell Session outcomes TBD	
10:15	**Break**	
10:30	**Plenary Session VI: Model Performance Evaluation (MPE) Tools** • Historic model performance results for Regional Haze modeling across the West • Improving and automating MPE Tools • Intermountain West Data Warehouse / Western Air Quality Study • NW-AirQuest/AirPact Session Leads: Gail and Tom Moore Session outcomes: • Examples of inadequate model performance evaluation; • Recommendations for improved MPE and; • Progress on developing new performance evaluation tools.	
11:45	**Wrap Up and Closing Remarks**	
12:00 pm	**Adjourn Workshop**	